Space Weather Forecast

Issued on Tuesday, 02 July 2024 at 13:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout. Chance of G1/G2 Minor/Moderate storm intervals Days 1-2 (02-03 Jul) due to Coronal Mass Ejection (CME) influences.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low in the last 24 hours with just Common-class flares. There are currently thirteen regions on the disc, the majority of which are small and simple. A region near south-centre disc is currently the largest and most complex region on the disc. It has recently developed some additional spots, including some magnetic complexity. Another region in the northeast quadrant is also a moderately long spot but smaller in areal extent, showing limited magnetic complexity, with some recent decay of its intermediate spots. The region in the southwest which was responsible for the Moderate-class flare yesterday has since been declining.
A Coronal Mass Ejection (CME) was observed following the Moderate-class flare on 01 July, this has been reassessed and is now considered most likely to miss ahead of Earth's orbit on 05 July. No other Earth-directed CMEs have been observed in imagery during the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds have been slightly elevated, on a declining trend. Wind speeds were initially near 480 km/s, falling to around 400 km/s. The Interplanetary Magnetic Field was weak throughout, with the north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary
Solar Activity: Low activity is likely to continue, with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: A large CME was observed leaving the Sun on 29 June, with a glancing blow likely either on Day 1 or Day 2 (02-03 Jul), although the bulk of the CME material is passing below Earth's orbit. There is significant uncertainty in the timing of this feature, however. A second CME which left the Sun on 01 July has now been assessed as passing ahead of Earth, perhaps with a very slight chance of a glancing blow on Day 4 (05 Jul). There are no significant coronal holes on the disc to give any fast wind influence. Geomagnetic activity is expected to be generally Quiet to Unsettled (Kp 1-3), with a chance of Active to G1/Minor storm (Kp 4-5) intervals and a slight chance of G2/Moderate storm intervals (Kp 6) on Days 1-2 under CME influence, however confidence is fairly low. Returning to mostly Quiet to Unsettled conditions during Days 3 and 4 (04-05 Jul).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, but with a very slight chance of exceeding the S1/Minor Storm threshold should any notable flares occur from the numerous sunspots that currently occupy the visible disc.
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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	30	5	5
Strong	G3	No	5	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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